

## CLAIMS

[100] We claim:

1. An isolated protein comprising SEQ ID NOS: 9, 13, 17, 21 or 25.
2. An isolated protein comprising SEQ ID NO: 26 linked to N-2 repeat(s) of SEQ  
5 ID NO: 27, where N equals an integer from 3 through 200.
3. The protein of claim 2, where N equals an integer from 5 through 50.
4. The protein of claim 2, where N equals an integer from 10 through 30.
5. An isolated protein comprising SEQ ID NO: 26 plus SEQ ID NO: 28 plus [N-2  
repeat(s) of SEQ ID NO: 27] plus SEQ ID NO: 29, where N equals an integer  
10 from 10 through 30.
6. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
protein of claim 1.
7. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
protein of claim 2.
- 15 8. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
protein of claim 3.
9. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
protein of claim 4.
10. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
20 protein of claim 5.
11. An isolated protein comprising SEQ ID NOS: 7, 11, 15, 19 or 23.
12. An isolated polynucleotide comprising a nucleic acid sequence encoding the  
protein of claim 11.
13. The polynucleotide of claim 6 wherein the polynucleotide comprises SEQ ID  
25 NOS: 8, 12, 16, 20 or 24.
14. The polynucleotide of claim 12 wherein the polynucleotide comprises SEQ ID  
NOS: 6, 10, 14, 18 or 22.

15. An isolated polynucleotide comprising a polynucleotide having at least 80% identity to SEQ ID NOS: 6, 10, 14, 18 or 22 over the entire length of the sequence.
- 5 16. The polynucleotide of claim 15 comprising a polynucleotide having at least 90% identity.
17. The polynucleotide of claim 15 comprising a polynucleotide having at least 95% identity.
18. The polynucleotide of claim 15 comprising a polynucleotide having at least 99% identity.
- 10 19. The protein of claims 1 or 2 wherein the protein is O-linked with  $\beta$ -(1-3)-Gal-GalNac.
20. A composition comprising a therapeutically effective amount of a protein of claim 19 in a pharmaceutically acceptable carrier.
21. The composition of claim 20 additionally comprising hyaluronan or hylan.
- 15 22. A method of treating a subject comprising:  
obtaining the composition of claim 20; and  
administering said composition to a tissue of the subject.
- 20 23. The method of claim 22 wherein the tissue is selected from the group consisting of cartilage, synovium, meniscus, tendon, peritoneum, pericardium, and pleura.
- 25 24. The method of claim 23 wherein the tissue is cartilage.
- 25 25. The method of claim 22 additionally comprising a step selected from the group consisting of: providing an anesthetic to the subject; providing an anti-inflammatory drug to the subject; providing an antibiotic to the subject; aspirating fluid from the subject; washing tissue of the subject; and imaging tissue of the subject.
26. The method of claim 22 wherein the subject is selected from the group consisting of a mouse, a rat, a cat, a dog, a horse and a human.
27. The method of claim 26 wherein the subject is a human.

28. An expression vector comprising the polynucleotide of claims 6 or 7 operably-linked to an expression control sequence.

29. A method of producing recombinant protein comprising:  
growing cells transformed with the expression vector of claim 28 in liquid  
5 culture media; and  
collecting recombinant protein from the media.

30. The method of claim 29, wherein the collecting protein comprises:  
concentrating the protein by filtering the media through a membrane;  
collecting the retained protein from the membrane; and  
10 solubilizing the collected protein in a buffered salt solution containing L-  
arginine hydrochloride ranging in concentration from 0.1 to 2.0 M.

31. The method of claim 30 wherein the L-arginine hydrochloride concentration is  
0.5 M.

32. An isolated antibody specific for a protein of claims 1 or 2.